

### **REMARKS**

By way of the present communication, applicants have canceled claims 2 and 9 and amended claims 1 and 8 since they have found that Fe does not produce multifaceted graphitic nanotubes in accordance with the process of the present invention. Applicants submit with this response a Declaration under 35 USC 1.132 by R. Terry K. Baker, an inventor on this application. This Declaration evidences that Fe is not a suitable Group VIII metal and for evidencing the unexpected properties of hydrogen for producing multifaceted graphitic nanotubes. Claims 10 and 11 have also been amended to correct both typographical errors and to make them dependent on a claim that has not been canceled.

Applicants acknowledge the allowance of claims 1-7. They have never-the-less amended claims 1-7 by limiting the Group VIII metal for producing the multifaceted graphite nanotubes to Co and Ni.

### **First Rejection Under 35 USC 103(a)**

Claims 8, 9, 13, and 14 have been rejected under 35 USC 103(a) as being obvious over Moy et al. (US 6,143,689).

#### **Examiner's Position**

It is the Examiner's position that Moy et al. teaches making carbon nanotubes from CO and Fe on Mg. The Examiner believes that while not describing the product as multifaceted he believes that any imperfection in the cylinder of Moy et al. would be a "facet". The Examiner also states that Moy et al. does not exemplify using H<sub>2</sub> and CO, but that choosing them together is an obvious expedient to optimize fiber formation by suppressing graphite, as hydrogen is well known to do in nanotube synthesis.

#### **Applicants' Position**

It is applicants' position that an imperfection would not change a cylindrical carbon nanotube into a multifaceted nanotube. Only very specific catalytic metals and conditions, which must include hydrogen, will lead to multifaceted graphitic nanotubes.

Applicants submit herewith a Declaration under 35 USC 1.132 containing experiments that evidence that Fe will not produce multifaceted graphitic nanotubes and that only when hydrogen is present with carbon monoxide, and with Co or Ni being the catalytic metal, will multifaceted graphitic nanotubes be produced.

The Addendum to the Declaration under 35 USC 1.132 shows a rough representation of the types of nanostructures produced by the experiments of this Declaration. Fe/MgO with carbon monoxide only will produce a structure similar to that represented by the first figure that shows a shell like structure. It will not produce a multifaceted nanotubular structure. When hydrogen is used in combination with carbon monoxide, the Fe/MgO catalyst will produce a "platelet" like structure that is also represented in the Addendum hereto. Only when the catalyst is Co/MgO or Ni/MgO will a multifaceted nanotubular structure be produced with carbon monoxide and hydrogen.

Therefore, applicants request that the Examiner reconsider and withdraw this rejection.

#### **Second Rejection Under 35 USC 103(a)**

Claim 10 have been rejected under 35 USC 103(a) as being unpatentable over Moy et al. as applied to claims 8, 9, 13 and 14 above, and further in view of Rodriguez '951.

#### **Examiner's Position**

The Examiner notes that Moy et al. does not teach the use of Co, but that Rodriguez does as an equivalent for Fe.

#### **Applicants' Position**

It is applicants' position that Co and Fe are not equivalents for the purpose of producing multifaceted graphitic nanotubes. The data set forth in the accompanying Declaration under 35 USC 1.132 show that Fe is not capable of producing multifaceted nanotubes, but that only Co and Ni are. Thus, applicants contend that it could not have

been obvious to substitute one for the other since the Declaration submitted herewith shows unexpected results when Co is used versus Fe.

Therefore, applicants request that the Examiner reconsider and withdraw this rejection.

The Examiner notes that claims 11 and 12 should be dependent on claim 1 instead of on claim 8. Applicants have amended claims 11 and 12 so that they are now both dependent on claim 1.

For the foregoing reasons it is applicants' position that the claims, as now amended, define a patentable invention over the cited art. Therefore, applicants request that this application be passed to allowance.

Respectfully submitted,

By 

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